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Teaberry Stalker Two Service Manual

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SERVICE MANUAL
FOR
STALKER TWO

CONTENTS

GENERAL INFORMATION OF MODEL: STALKER TWO (SSB/AM)

1. Type of Emission .....3A3J.....6A3..... "D" Class

2. Frequency Range

Channel	MHz	Channel	MHz	Channel	MHz
1	26.965	9	27.065	17	27.165
2	26.975	10	27.075	18	27.175
3	26.985	11	27.085	19	27.185
4	27.005	12	27.105	20	27.205
5	27.015	13	27.115	21	27.215
6	27.025	14	27.125	22	27.225
7	27.035	15	27.135	23	27.255
8	27.055	16	27.155		

3. RF Output Power Rating ..... 4 Watts (AM), 12 Watts PEP

4. Voltage and Current At Final Stage ... 5.5 Volts and 740 mA at Channel 12.

5. Function of Transistor ..... Per attached list of function of transistors/diodes.

6. Circuit Diagram ..... Per attached Circuit Diagram.

7. Tune-up Prodecure ..... Per attached Alignment Instructions.

8. Automatic Modulation Control (AMC) (ALC) ... Per attached Circuit Diagram.

SPECIFICATION FOR MODEL: STALKER TWO

Power Source	13.8 volts (DC) 110 volts (AC)
Antenna Impedance	50 ohms
Test Temperature	25 °C
AM Modulation Frequency	1 KHz
SSB Modulation Frequencies	500 Hz & 240 Hz
Standard Antenna Input Voltage	1000 uV
Standard Audio Output Power	0.5 W
SSG Modulation (AM)	1 KHz 30 %
Audio Output Frequency (SSB)	1 KHz
Audio Output Load	8 ohms

TRANSMITTER	UNIT	NOMINAL (AM)	(SSB)
Frequency Tolerance (-30°C to +50°C).	%	0.005	0.005
RF Output at no mod (AM).	W	3.5	*
Rated Output Power (SSB).	Wpep	*	10
Maximum Output Power (SSB).	Wpep	*	12
Modulation Distortion at 80% Mod (AM)	%	3	*
Spurious Emission.	dB	-55	-55
Carrier Emission (SSB).	dB	*	-55
Battery Drain at no mod.	mA	1800	1500
Battery Drain at 80% Mod(AM),10 Wpep (SSB)	mA	2500	2200
AC Power Drain at no Mod.	W	*	*
AC Power Drain at 80% Mod. (AM) 10 Wpep SSB	W	*	*
Microphone Amp Sensitivity at 50% Mod. AM, 4 Wpep SSB	mV	4	4
Receiver (Noise Blanker -OFF)			
Sensitivity for 500 mW Output	uV	0.25	0.125
Sensitivity for 10 dB S/N.	uV	0.5	0.125
A.G.C. Figure of Merit 50 KuV for 10 dB change in Audio Output.	dB	80	80
Selectivity at 6 dB down	KHz	4.2	4.2
Cross Modulation. (E.I.A. Standard)	dB	60	60

SPECIFICATION FOR MODEL: STALKER TWO

Receiver (Noise Blanker - OFF)	UNIT	NOMINAL (AM)	NOMINAL (SSB)
Maximum Audio Output Power - 8 ohms load	W	6.0	6.0
Audio Output Power at 10% - 8 ohms load Distortion	W	4.5	4.5
RF Gain Attenuation, Adjustable	dB	40	40
Fidelity at 450 Hz (1KHz 0dB Reference).	dB	-3	-3
Fidelity at 2.2 KHz (1KHz 0dB Reference).	dB	-10	-3
Squelch Sensitivity at Threshold	uV	0.3	0.3
Squelch Sensitivity at Tight.	uV	1000	1000
S Meter Sensitivity for S-9.	uV	50	50
Image Rejection at 30.8 MHz	dB	50	50
Front end attenuation at IF Frequency of 7.8 MHz.	dB	90	90
Hum & Noise Ratio Below Antenna input 1 mV.	dB	50	*
Oscillator Dropout Voltage.	V	8.0	8.0
Battery Drain at no Signal (DC).	mA	600	600
AC Power Drain at no Signal.	W	*	*
Clarifier Range (Receiver only)	Hz	1000	1000
Adjacent Channel Selectivity.	dB	60	70
PA Output Power at 10% Distortion -8 ohms Load	W	4.5	*

A. Oscillator Circuit Description

1. Explanation of phase Locked Loop (P.L.L.) frequency Synthesizer System.

   a. The Loop consists of V.C.O. (Voltage Controlled Oscillator), inloop mixer, TTL driver, programable 1/N frequency driver, phase detector, low pass filter, and back to V.C.O. See Block Diagram Figure 1.

   b. To change the frequency desired, the number N is changed in the programable 1/N frequency divider which consists of IC405 and IC406 as illustrated in Fig. 2B.

   c. The key point of the PLL is that at the phase detector, it compares the same 10 kHz frequencies, one reference frequency 10 kHz "REF 1" produced by clock oscillator (IC404 and X401, 10 MHz), and frequency divider of one 1000th which consists of IC403, IC402, and IC401, each reducing the frequency by the factor of one tenth. Another frequency is the output of 1/N divider which is arranged by the diode matrix, D401 through D408, and channel selector switch S401. See Fig. 2B. The number N as divider is selected in such manner that the output of 1/N divider going into the phase detector always becomes 10 kHz.

   d. The choice of N is determined by the following rule;

$$\frac{fvco - fstd}{N} = 10 \text{ kHz}$$

$$N = \frac{fvco - fstd}{10 \text{ kHz}}$$

   Note; fstd is the output of external Mixer TR-21, See paragraph 2-4 below.

2-1. For example, if we want to produce channel 1, AM transmitt carrier, 26.965 MHz, the N must be set to 70. For the ease of explanation the writer chose to use a reverse sequence in phenomena to occur in in producing 26.965 MHz. Since the output of 1/N divider will become 10kHz, the output of the inloop mixer must be 700 kHz. The TTL driver is simply an amp and interface to the divider.

2-2. A frequency of 13.1325 MHz is produced by TR-19 (See main schematic, Fig. 2-A) and X2. Then doubled by TR-20, ie 26.265 MHz, "REF 2". This output is then fed to the external Mixer, TR-21.

2-3. Another frequency "REF 3" is produced for AM TX by X4 and its switch diode D39 connected and TR-26 at 7.7975 MHz, and also fed into the external Mixer, TR-21.

2-4. For AM TX the extermal mixer produces the difference frequency of 26.265 MHz produced in paragraph 2-2 and 7.7975 MHz generated in paragraph 2-3, which is 18.4675 MHz, and for this discussion call it fstd in paragraph 1d. This then fed to the inloop Mixer.

2-5. The inloop mixer output frequency is said to be 700 kHz by paragraph 2-1 and one of the input is 18.4675 MHz as fstd. Then since inloop mixer is taking the difference of fvco and fstd, fvco must be controled to produce 19.1675 MHz. This is accomplished by the phase detector, IC 1, detecting the phase difference between 10 kHz of "RDF1" and the output of 1/N divider which also is to be 10 kHz. And IC1 sends information through lowpass filter to vco which consist of oscillator FET 3 and frequency controlling varactor diode, D18. Vco stands for Voltage controled oscillator.

2-6. Thus the loop is completed and by the choice N = 70, the vco is locked to produce 19.1675 MHz. Going back to the original desire to produce 26.965 MHz is done by taking fvco through a buffer called "19 MHz Local" (inthe Block Diagram Fig. 1) TR-11 to the Balanced Mixer IC 4 in the transmitter section of the set, adding 7.7975 MHz produced ad "REF 3" in paragraph 2-3.

2-7. It was said and explained regarding use of N-70 to produce carrier frequency of 26.965 MHz. Same sequency of explanation can be made to produce 26.975 MHz channel 2 carrier by setting N = 71, etc.

3. For the USB transmission therefore foregoing discussions apply.

4-1. For LSB transmission, carrier frequency is such that "REF 3" Frequency produced in TR-26 must be changed to 7.8025 MHz by use of Crystal X3 and D38 and Disabling X4 with D39. This is 5 kHz increase in REF 3 frequency.

4-2. The change of 5kHz in "REF3" frequency does not change the carrier frequency for LSB from USB carrier because: $fc = fvco + f\ REF\ 3$
and $fvco = (f\ REF\ 2 - f\ REF\ 3) + N \times 10\ kHz$
then $fc = (f\ ref\ 2 - f\ REF\ 3) + N \times 10\ kHz + f\ REF\ 3$
Therefor whatever change in REF 3 frequency is made,

it is cancelled. f REF 3 is used to balance modulate and same side band crystal filter is used to trap out unwanted side band for USB and for LSB.

5. For receive mode, the local oscillator frequency is the same PLL System.

5-1. On AM receive, carrier oscillator TR-26 "REF 3" is disabled, and AM RX oscillator TR-22 and X1 44.730 MHz "REF 4" are activated. This frequency is fed to external Mixer, instead of REF 3 frequency.

5-2. The external mixer output frequency (fstd) is 44.730 MHz (REF 4) -26.265 MHz (REF 2), which is 18.465 MHz.

5-3. In order to receive Channel(1) 26.965 MHz, Local oscillator frequency of 19.165 MHz (fvco) is required for 7.800 MHz IF. At inloop mixer output (fvco - fstd) same 700 kHz is called for and N=70 on 1/N devider is used same as foregoing discussion.

5-4. Similary as transmission REF 3, TR-26 oscillator is used to synthesize local oscillator frequency for USB and LSB.

B. SSB Transmission Power Limiter

1. Also on mic amp circuit has automatic level control consisting of IC 4 as mic amp and taking the output of the IC 4 and D26 and D29 as voltage doubling rectifier producing positive DC voltage. This voltage is amplified by TR 16 and TR 17 and fed to TR 18 to shunt the output from microphone. This audio level control works the same way for AM as for SSB.

C. Spurious Radiation Suppresion

1. The output frequency resultant of the phase looked loop is a pure single frequency by nature of the system because it is a well controled free running oscillator of the VCO, and only by virtue of the phase locked loop that the VCO must oscillate at the exact prescribed frequency. It is incapable of producing any other frequencies.

2. The balanced Mixer IC 5 receives the pure fvco and output of carrier oscillator TR 26 with either X3 or X4, a single crystal oscillator without synthesization. There for this frequency is also fairly clean.

3. On top of above facts the balance Mixer will remove clean the two injected frequencies, leaving only desired 27 MHz band

4. The high intermodulation products produced by the balanced Mixer is suppressed bycontrolling the injection levels of each frequency inputs.

5. The lowpass filter is placed after the RF power amp stage consisting of L8, L7, and L6, and C167, C165 and C164 to eliminate the harmonics of the desired radiated frequency.

6. C163 and L5 forms the trap for 54 MHz band to suppress intereference to low TV channels.

D. Description of Overall Design

AM receiver is a single superheterodyne system using 7.800 MHz IF utilizing a crystal filter of +2.1 kHz bandwidth with diode detector and audio amplifier to the speaker. The local oscillator frequency is synthesized by phase locked loop system.
SSB receiver is similar to AM receiver except the carrier restoration frequency is designed to utilize one of the crystal oscillator needed for phase locked loop making very accurate carrier frequency.
AM transmission is same as ordinary transmitter modulating the voice at the RF power stages.
SSB transmitter follows farily common system of IC balance modulator, IC3 at internal carrier frequency of 7.7975 MHz for USB and 7.8025 MHz for LSB using one crystal filter f or both USB and LSB for removal of unwanted sideband and resulting in same suppressed carrier frequencies for USB and LSB.
The use of the phase locked loop assures the absolute frequency figure to be closest to the predetermined and assigned frequency and the diviation is dependant on only few crystals used in the PLL structure.

E. Stalker TWO CLARIFIER SYSTEM

1. The clarifier circuit works with one of the reference frequency producer namely X2 crystal at 13.1325 MHz and TR-19.
2. A DC voltage supplied to the cathode of a varactor diode D34 change the oscillated frequency by X2.
3. However, D32 and D33 are diode switches which selects the source of the DC voltage to the varactor D34.
4. The clarifier control on the front panel VR 10 works only on receive mode by closing the D33 by relay switch next to R190 supplying a positive voltage, through R190, R96 and VR9 and VR11 is to adjust the clarifier range on receive mode.

5. On the transmitt mode, the D33 becomes open circuit and disables the clarifier control action due to the relay contact next to R190 is grounded and the positive voltage is supplied to the cathode of D33. Through D32 making D39 completely reversed bias-ie open.
On the transmitt mode the VR7 which is internal frequency adjust for transmitt frequency and is supplied to the varactor D33 via D32 switch diode being closed by positive bias on the anode. This positive voltage is supplied from relay through R176, R94, to VR7. Therefore there is on access to change frequency form outside by a user.

P. L. L. ALIGNMENT

TEP	INSTRUCTIONS	ADJUST	ADJUST FOR
1.	Set Channel Select to Channel 23 in USB RX Mode.		
2.	Connect the Oscilloscope to TR 4	T-20	Max. Output indicated on Oscilloscope
3.	Connect Oscilloscope + Frequency Counter to TP 4	CT 3	7.7985 MHz +0/-5Hz
4.	Change to LSB Mode	CT 2	7.8025 MHz +0/-5Hz
5.	Repeat Steps 2, 3, and 4.	T 20	Max. Output Indicated on oscilloscope
6.	Connect Oscilloscope to TP 3 and return to USB	T 13 T 19	Peak Gain
7.	Connect Frequency Counter to Output of 10 MHz Ref. Osc.	CT 401	10 MHz ± 100 Hz
8.	Connect Frequency Counter to TP 2	T 12	990 KHz
9.	Turn Channel Selector to Channel 1	T 12	700 KHz
10.	Repeat Steps 7 and 8		
11.	Turn Channel Select to Channel 13		

P.L.L. ALIGNMENT CONT'd

STEP	INSTRUCTIONS	ADJUST	ADJUST FOR
12.	Connect Oscilloscope + Frequency Counter to TP 1.	T 10 T 11	For Peak Gain
13.	Set Clarifier to Center and Channel Sel. to Channel 1. (Test Equip to be as Step 11)	VR 8	19.1675 MHz
14.	Same as Step 12 with Clarifier adjust to CW-CCW Max.	VR 9 VR 11	± 1.5 KHz of 19.1675 MHz
15.	Same as Step 12 in TX Mode	VR 7	19.1675 MHz
16.	Channel 1 - AM RX Mode - Clarifier at Center. Oscilloscope at TP 3	T 14	Max Output at TP 3
17.	Same as Step 15 + Frequency Counter at TP 1.	CT 1	19.1650

RECEIVER ALIGNMENT

STEP	INSTRUCTIONS	ADJUST	ADJUST FOR
1.	Channel 13 USB MODE Volume Full Clockwise R.F. Gain Max Squelch Full Counter-Clockwise Clarifier at Center PA-CB at CB N/B off		
2.	Connect 8 OHM Load to External Speaker. Connect AF Volt Meter Oscilloscope across load. Connect Signal Generator to Antenna Connector Set Generator at 27.115 MHz at .125 uv Output	T 4	Max. Audio Output
3.	Same as Step 2	T 5	Same as step 2
4.	Same as Step 2	T 6	Same as step 2
5.	Same as Step 2	T 7	Same as step 2
6.	Same as Step 2	T 8	Same as step 2
7.	Same as Step 2	T 9	Same as step 2
8.	Same as Step 2	VR 4	2.0 V Audio Output on all channels
9.	Signal Generator 50 uv Output	VR 2	S-9 on S-Meter
10.	Squelch Alignment Turn Squelch fully clockwise Signal Gen. 1 mv	VR 5	Until signal breaks squelch
11.	Reduce Signal to 0 Output, adjust Squelch Control to point where Noise just ceases to be heard.		

Receiver alignment cont.....

STEP	INSTRUCTIONS	ADJUST .	ADJUST FOR
12.	Increase Signal Gen. to .25 uv. This should break Squelch.		
13.	RF Gain Alignment Signal Gen. at .5 uv Output.	Volume Control	2 ✓ Output at 8 Ω load
14.	Set R. F. Gain to Max. Signal Gen. at .50 uv Output	VR 1	2 ✓ Output at 8 Ω Load
15.	Same as Step # 2	VR 3	Minimum noise with maximum sensitivity

Noise Blanker Alignment

Step	Instruction	Adjustment	Adjust For
1	Inject a 40 MHZ CW Signal at Ant. I Connect scope to TP 5	T1 T2 T3	Maximum Output

AC POWER SUPPLY ALIGNMENT

Step	Instructions	Adjust	Adjust For
1	AC/DC Switch in AC position connect VTVM across points A&B	VR 501	13.8 VDC

SSB TRANSMITTER ALIGNMENT

STEP	INSTRUCTIONS	ADJUST	ADJUST FOR
1.	USB MODE Channel 13 VR6, VR12 to be at Max. Set Dual Tone Gen. 1mv at Mic Input RF Power Meter with 50OHM Load at Antenna Terminal with Oscilloscope	T-18 T-17 T-16 T-15 L-10 L-8	Max Output
2.	Set Mic Input at .2mv	T-18 T-17 T-16 T-15	Max Output
3.	Increase Mic Input Gen. to 20mv.	L-10 L-8	Max. Output
4.	Decrease Mic Input Gen. to .1mv	VR-15	Min. Crossover
5.	Same as Step 4	VR-6 VR-12	10.5 W PEP
6.	Increase Audio Input to 10db	VR-6 VR-12	11.5 W PEP
7.	Repeat Steps 5 and 6 untill Correct Output is reached.		

SSB TRANSMITTER ALIGNMENT Cont'd

STEP	INSTRUCTIONS	ADJUST	ADJUST FOR
8.	Decrease Audio Input to 0.	VR-14	Min. Resedual Carrier should be less than -40db.
9.	Change to LSB MODE and Repeat Step 8.		

AM TRANSMITTER ALIGNMENT

STEP	INSTRUCTIONS	ADJUST	ADJUST FOR
1.	MODE to be AM RF Power Meter with 50Ω Load. Osc. to be connected to Antenna Terminal with Transmitter keyed.	VR-17	3.5 W Output
2.	Set Single Tone Gen. at 500Hz at Mic Input.	GEN	50% Modulation at Output.
3.	Increase Audio by 16db.	VR-13	80%Modulation at Output.
4.	Change Audio Gen to 2.5KHz and Repeat Steps 2 and 3.		
5.	Tune to 54MHz on Spectrum Analyzer.	L-5	54MHz Lowest Output
6.	Check to be Sure all Spurious Harmonics are Attenuated More than 50db Below Fundamental.		
7.	Same as Step # 1	VR 16	RF meter to read between red and white scales
8.	Same as Step # 2	VR 18	Minimum Distortion

SHORT FORM TROUBLE SHOOTING GUIDE

I. Radio Appears to Be Dead When Power Is Switched On

1. Check Fuse
2. Check D 46 for short.
3. Check Power supply transistors against DC voltage chart.

II. No Receive Or Rush Noise

1. Open squelch completely
2. Switch local DX to DX position
3. Be sure radio is on AM channel 23
4. Check TP 2 for correct frequency (990 KHz) corresponding to the channel if the frequency is incorrect, check:
   A. TR 22 for correct frequency. (44.730 MHz.)
   B. TR 19 for correct frequency. (13.1325 MHz.)
   C. TP 3 for correct frequency. (18.465 MHz.)
   D. Pin 1 of phase det., IC 1 for 10 KHz.
   E. Output of TR 25 for approximately 4.5 V.
5. Introduce an audio signal at the volume control, if no signal:
   A. Check audio final chip.
   B. Check C 200.
   C. Check speaker.
   D. Check for bad wires.
6. If audio is bad connect a RF generator to antenna connector with approximately 10 uv. input and check signal strength TR 9.
7. If signal is weak, increase input signal and check back through circuit to see where signal is lost.

III. No Transmit on AM

1. Check to be sure receiver is working.
2. Check PA-CB switch is in correct mode.
3. Try a different mic.

4. Be sure relay is switching.

5. Check TR 26 for good oscillation and correct frequency.

6. Check TP . for 19 MHz. signal.

7. Check TP 4 for a 7.7975 MHz. signal.

8. Check TR 30 for 27 MHz. signal.

9. Check TR 29 for 27 MHz. signal.

10. Check TR 28 for 27 MHz. signal.

IV. NO Transmit SSB

1. Be sure radio is transmitting on AM.

2. Try a different mic.

3. Check TR 27 for a gain of audio signal.

4. Check TR 26 for a gain of 7 MHz. signal.

V. No Modulation on AM

1. Be sure receiver is working correctly.

2. Try a different mic.

3. Check IC 4 for amplification of audio.

4. Check TR 16 - 17 - 18 for short or open.

5. Check ouput transformer for open and signal.

LOGIC TABLE

	IC 405 P +				IC 406 P +			
	PINS							
Channel	3	4	5	6	3	4	5	6
1.	0	0	0	0	1	1	0	0
2.	1	0	0	1	0	1	0	0
3.	0	0	0	1	0	1	0	0
4.	0	1	1	0	0	1	0	0
5.	1	0	1	0	0	1	0	0
6.	0	0	1	0	0	1	0	0
7.	1	1	0	0	0	1	0	0
8.	1	0	0	0	0	1	0	0
9.	0	0	0	0	0	1	0	0
10.	1	0	0	1	1	0	0	0
11.	0	0	0	1	1	0	0	0
12.	0	1	1	0	1	0	0	0
13.	1	0	1	0	1	0	0	0
14.	0	0	1	0	1	0	0	0
15.	1	1	0	0	1	0	0	0
16.	1	0	0	0	1	0	0	0
17.	0	0	0	0	1	0	0	0
18.	1	0	0	1	0	0	0	0
19.	0	0	0	1	0	0	0	0
20.	0	1	1	0	0	0	0	0
21.	1	0	1	0	0	0	0	0
22.	0	0	1	0	0	0	0	0
23.	1	0	0	0	0	0	0	0

Logic 0 = Ground

Logic 1 = Supply

LOGIC DECODING

IC 405

Channel	Pin # 2
1.	700 khz
2.	710 khz
3.	720 khz
4.	740 khz
5.	750 khz
6.	760 khz
7.	770 khz
8.	790 khz
9.	800 khz
10.	810 khz
11.	820 khz
12.	840 khz
13.	850 khz
14.	860 khz
15.	870 khz
16.	890 khz
17.	900 khz
18.	910 khz
19.	920 khz
20.	940 khz
21.	950 khz
22.	960 khz
23.	990 khz

TRANSISTOR D.C. VOLTAGE MEASUREMENT CHART

FUNCTION	TRANSISTOR	TX	RX	EMITTER	BASE	COLLECTOR
N/B BAND AMP	TR1		X	.2	.9	8.0
N/B BAND AMP	TR2		X	.2	.9	8.0
N/B D.C. AMP	TR3		X	8.3	7.9	0
N/B D.C. AMP	TR4		X	0	N/M	N/M
RF AMP	TR5		X	.7	1.4	8.2
IF AMP	TR6		X	.6	1.2	9.1
AM TX AMP	TR7	X*		1.0*	1.7*	9.1*
IF RX AMP	TR8		X	0	.6	2.7
IF RX AMP	TR9		X	1.9	2.6	7.0
AM AUDIO AMP SSB PRODUCT DET.	TR10		X	.1	.6	7.7
V.C.O. BUFFER AMP	TR11	X	X	.4	1.1	7.6
T T L DRIVER	TR12	X	X	.1	.7	4.5
	TR13					
SQUELCH AMP	TR14		X	0** / 0	.1** / .6	.7** / .1

* AM TRANSMIT MODE
** SQUELCH OPEN

TRANSISTOR VOLTAGE CHART cont'd

TION	TRANSISTOR	TX	RX	EMITTER	BASE	COLLECTOR
SQUELCH AMP	TR15		X	0** / 0	.7** / .1	N/M** / 3.0
LIMITER AMP	TR16	X		0	.4	9.5
TER AMP	TR17	X		9.5	9.5	N/M
SHORTING	TR18	X		0	N/M	N/M
EXT OSC.	TR19	X	X	1.8	2.1	7.7
DOUBLER	TR20	X	X	N/M	.6	7.7
EXT. MIXER	TR21	X	X	.4	.7	7.8
AM RX OSC.	TR22		X	1.3	1.8	7.8
LOW PASS FILTER	TR23	X	X	1.1	1.6	7.9
LOW PASS FILTER	TR24	X	X	.6	1.1	2.5
CARRIER OSC.	TR26***	X	X	2.6	3.3	9.1
SSB MIC AMP	TR27	X		1.7	2.4	7.2
RF FINAL	TR28	X		0* / 10	.14* / .5	7.6* / 13.4
TX DRIVER	TR29	X		0* / 0	.5* / .5	7.6* / 13.4
TRF DRIVER	TR30	X		.3	1.0	8.8
AM PWR REG	TR31	X		5.8	6.4	10.0

**SQUELCH OPEN
*** OSC. INACTIVE IN AM RECEIVE MODE ONLY
* AM TRANSMIT MODE

TRANSISTOR VOLTAGE CHART cont'd

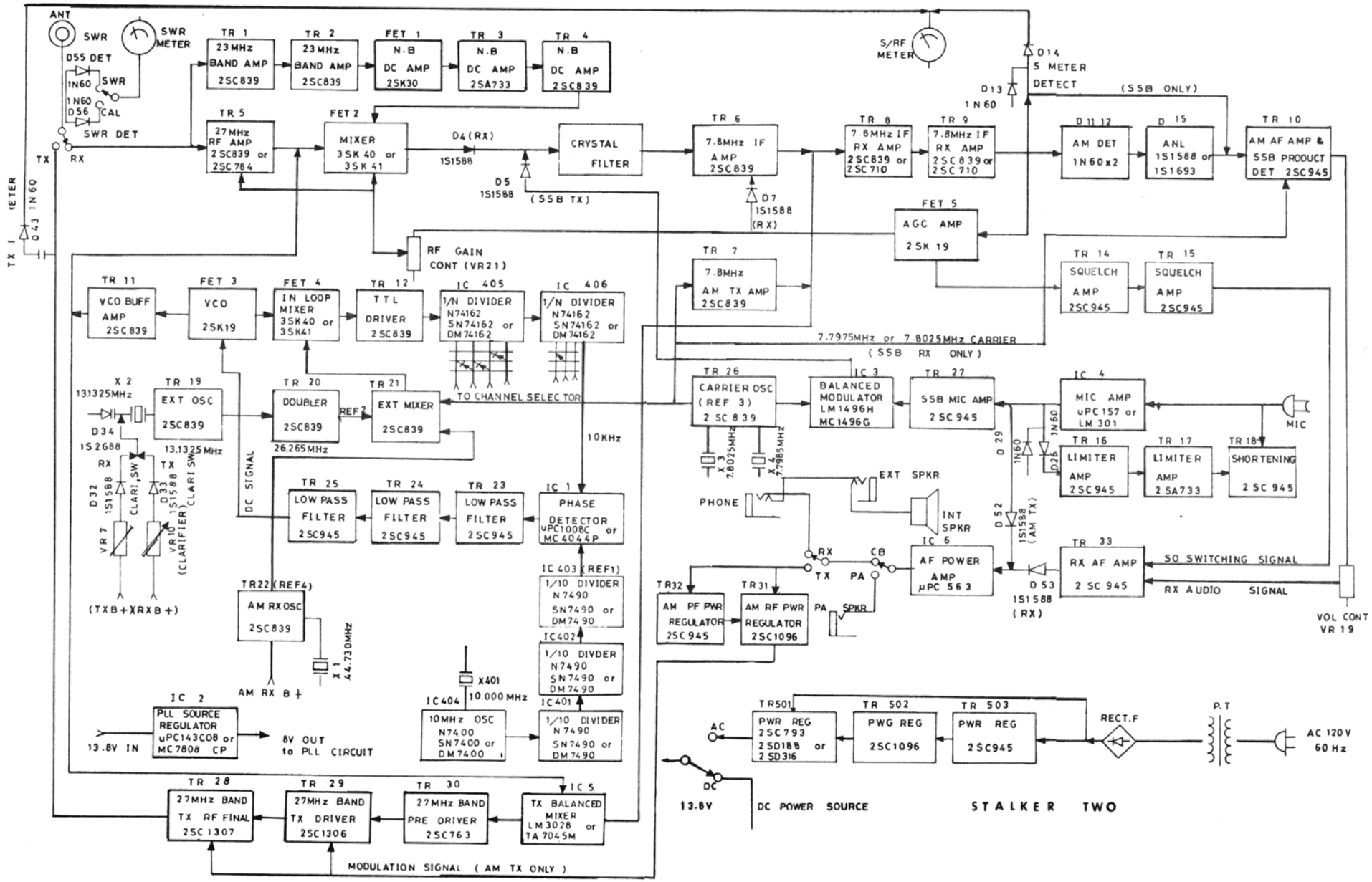
FUNCTION	TRANSISTOR	TX	RX	EMITTER	BASE	COLLECTO
AM PWR REG	TR32	X		9.3	10.0	13.2
RX AF AMP TR	TR33		X	1.9	2.5	6.6

FET D.C. VOLTAGE MEASUREMENT CHART

FUNCTION	FET	TX	RX	SOURCE	DRAIN	GATE1	GATE2
N/B DC AMP	FET1		X	6.8	1.6	0	
MIXER	FET2		X	8.2	.3	0	0
INLOOP MIXER	FET4	X	X	7.2	.3	0	0
AGC AMP	FET5		X	2.1	8.12	0	

	Phase Det.	8 Volt Regulator	Balanced Modulator	Mic Amp	Balanced Mixer	AF Power Amp	Reference Divider	Reference Divider	Reference Divider	10 Mc Osc.	1/n Divider	1/n Divider
IC Designation	IC 1	IC 2	IC 3	IC 4	IC 5	IC 6	IC401	IC402	IC403	IC404	IC405	IC406
TX	X	X	X	X	X	X	X	X	X	X	X	X
RX	X	X				X	X	X	X	X	X	X
Pin 1	1.8	13.5	3.8	1.4	4.8	13.6	1.4	1.8	1.8	1.4	4.5	4.5
Pin 2	3.6	0	3.1	4.5	3.1	N/C	0	0	0	1.4	1.8	1.8
Pin 3	3.3	7.8	3.1	4.5	0	12.6	0	0	0	1.1	2.6	4.5
Pin 4	3.6		3.8	0	2.5	7.0	0	0	0	1.8	.2	0
Pin 5	1.8		1.1	1.4	4.8	1.4	4.5	4.5	4.5	1.8	2.7	0
Pin 6	N/C		6.4	4.5	9.0	6.6.	0	0	0	1.3	.2	0
Pin 7	0		6.0	9.0	9.0	6.6	0	0	0	0	.4	.5
Pin 8	N/C		6.0	4.0	9.0	0	1.3	1.5	1.5	3.3	0	0
Pin 9	N/C		6.6			N/C	1.3	1.5	1.5	.2	3.3	3.4
Pin 10	1.8		0			6.6	0	0	0	.2	1.5	.6
Pin 11	3.6						.8	.8	.8	3.3	.9	.9
Pin 12	N/C						1.8	1.8	1.8	.2	1.6	1.8
Pin 13	3.6						0	0	0	.2	1.6	1.8
Pin 14	4.8						.8	.8	.8	4.5	2.1	2.1
Pin 15											.6	.2
Pin 16											4.5	4.5

All measurements made on channel 13 with a DC VTVM.


ANT
SWR
SWR METER
D55 DET
1N60
SWR
1N60
D56
CAL
SWR DET
TX
RX
TR 1
23MHz BAND AMP 2SC839
TR 2
23MHz BAND AMP 2SC839
FET 1
N.B DC AMP 2SK30
TR 3
N.B DC AMP 2SA733
TR 4
N.B DC AMP 2SC839
TR 5
27MHz RF AMP 2SC839 or 2SC784
FET 2
MIXER 3SK40 or 3SK41
D4(RX)
1S1588
D5
1S1588
(SSB TX)
CRYSTAL FILTER
TR 6
7.8MHz IF AMP 2SC839
D7
1S1588
(RX)
TR 8
7.8MHz IF RX AMP 2SC839 or 2SC710
TR 9
7.8MHz IF RX AMP 2SC839 or 2SC710
S/RF METER
D14
S METER DETECT
(SSB ONLY)
D13
1N60
D11 12
AM DET 1N60x2
D 15
ANL 1S1588 or 1S1693
TR 10
AM AF AMP & SSB PRODUCT DET 2SC945
FET 5
AGC AMP 2SK19
RF GAIN CONT (VR21)
TR 7
7.8MHz AM TX AMP 2SC839
TR 14
SQUELCH AMP 2SC945
TR 15
SQUELCH AMP 2SC945
TR 11
VCO BUFF AMP 2SC839
FET 3
VCO 2SK19
FET 4
IN LOOP MIXER 3SK40 or 3SK41
TR 12
TTL DRIVER 2SC839
IC 405
1/N DIVIDER N74162 SN74162 or DM74162
IC 406
1/N DIVIDER N74162 SN74162 or DM74162
7.7975MHz or 7.8025MHz CARRIER
(SSB RX ONLY)
X 2
13.1325MHz
TR 19
EXT OSC 2SC839
13.1325MHz
D34
1S2688
RX
TX
CLARI SW
D32
1S1588
D33
1S1588
VR 7
VR 10
(CLARIFIER)
(TXB+ XRXB+)
TR 20
DOUBLER 2SC839
26.265MHz
REF2
TR 21
EXT MIXER 2SC839
TO CHANNEL SELECTOR
10KHz
DC SIGNAL
TR 26
CARRIER OSC (REF 3) 2 SC 839
X 3
7.8025MHz
X 4
7.7975MHz
IC 3
BALANCED MODULATOR LM1496H MC1496G
TR 27
SSB MIC AMP 2SC945
IC 4
MIC AMP uPC157 or LM 301
MIC
D 29
1N60
D26
1N60
TR 16
LIMITER AMP 2SC945
TR 17
LIMITER AMP 2SA733
TR 18
SHORTENING 2SC945
TR 25
LOW PASS FILTER 2SC945
TR 24
LOW PASS FILTER 2SC945
TR 23
LOW PASS FILTER 2SC945
IC 1
PHASE DETECTOR uPC1008C or MC4044P
EXT SPKR
PHONE
INT SPKR
D 52
1S1588
(AM TX)
IC 403 (REF1)
1/10 DIVIDER N 7490 SN7490 or DM7490
IC 6
AF POWER AMP µPC 563
TR 33
RX AF AMP 2 SC 945
SO SWITCHING SIGNAL
RX AUDIO SIGNAL
D 53
1S1588
(RX)
VOL CONT VR 19
RX
TX
PA
CB
TR32
AM PF PWR REGULATOR 2SC945
TR31
AM RF PWR REGULATOR 2SC1096
PA
SPKR
TR22 (REF4)
AM RX OSC 2SC839
X 1
44.730MHz
AM RX B+
IC402
1/10 DIVDER N7490 SN7490 or DM7490
IC401
1/10 DIVIDER N 7490 SN7490 or DM7490
X401
10.000 MHz
IC404
10MHz OSC N7400 SN7400 or DM7400
IC 2
PLL SOURCE REGULATOR uPC143C08 or MC7808 CP
13.8V IN
8V OUT to PLL CIRCUIT
TR501
PWR REG 2SC793 2SD188 or 2SD316
TR 502
PWG REG 2SC1096
TR 503
PWR REG 2SC945
AC
RECT.F
P.T
AC 120V 60Hz
DC
13.8V
DC POWER SOURCE
TR 28
27MHz BAND TX RF FINAL 2SC1307
TR 29
27MHz BAND TX DRIVER 2SC1306
TR 30
27MHz BAND PRE DRIVER 2SC763
IC 5
TX BALANCED MIXER LM 3028 or TA 7045M
MODULATION SIGNAL (AM TX ONLY)
STALKER TWO

STALKER TWO PARTS LIST

REFERENCE NO.	TEABERRY PART NO.	DESCRIPTION
IC-1	DDEY019001	I.C. MC4044P
IC-2	DDEY028001	I.C. uPC143C08
IC-3	DDEY001001	I.C. LM1496H
IC-4	DDEY026001	I.C. uPC157A
IC-5	DDEY002001	I.C. LM3028BH
IC-6	DDEY027001	I.C. uPC563H2
IC-401,402,403	DDEY029001	I.C. DM7490
IC-404	DDEY030001	I.C. DM7400
IC-405,406	DDEY033001	I.C. DM74162
FET-1	DDCY002002	F.E.T. 2SK30GR
FET-2,4	DDCY103001	F.E.T. 3SK41M
FET-3	DDCY001001	F.E.T. 2SK19GR
FET-5	DDCY001002	F.E.T. 2SK19BL
TR-1,2,4,6,7,8,9, 11,12,19,20,21, 22,26	DDBY222002	Transistor 2SC839H
TR-3,17	DDBY003003	Transistor 2SA733P
TR-5	DDBY219001	Transistor 2SC784R
TR-10,14,15,16,18, 23,24,25,27,32, 33,503	DDBY224002	Transistor 2SC945R
TR-28	DDBY231002	Transistor 2SC1307 (1)
TR-29	DDBY230001	Transistor 2SC1306
TR-30	DDBY216002	Transistor 2SC763D
TR-31,502	DDBY227001	Transistor 2SC1096-3ZM
TR-501	DDBY403001	Transistor 2SD188M
D-1,2,11,12,13,14, 19,21,28,29,43, 401,406,407,408	DDAY001001	Diode IN60
D-3,4,5,6,7,8,9,10, 15,16,17,20,22,23,		

REFERENCE NO.	TEABERRY PART NO.	DESCRIPTION
24,25,30,32,33,38, 39,40,42,52,53,54, 59,60	DDAY047001	Diode 1S1588
D-18,34	DDAY006002	Zenor Diode 1S2688B
D-31,36,48,501	DDAY008001	Zenor Diode WZ-061
D-35,41	DDFY004002	Varistor KB-062
D-44,45,51	DDAY010002	Zenor Diode CZ-092
D-46	DDAY002002	Diode SR1K-2
D-37	DDAY009001	Zenor Diode BZ-052
D-47	DDAY036001	Diode G2BJ
D-49	DDAY008003	Zenor Diode WZ-081
D-55,56	DDAY001002	Diode IN60P
D-57	DDAY007001	Light Emitting Diode TLR-104
D-58	DDAY032001	Light Emitting Diode TLG-103
D-502	DDAY009003	Zenor Diode BZ-162
D-503,504,505,506	DDAY011001	Diode, HI-FI Special
T-1	LLAY039001	Coil LA-039
T-2,3	LLAY140001	Coil LA-140
T-4	LLAY080001	Coil LA-080
T-5,6	LLAY088001	Coil LA-088
T-7	LLAY038001	Coil LA-038
T-8	LLAY094001	Coil LA-094
T-9	LLAY096001	Coil LA-096
T-10	LLAY092001	Coil LA-092
T-11,19	LLAY091001	Coil LA-091
T-12	LLAY141001	Coil LA-141
T-13	LLAY138001	Coil LA-138
T-14	LLAY103001	Coil LA-103
T-15	LLAY069001	Coil LA-069
T-16	LLAY087001	Coil LA-087
T-17	LLAY082001	Coil LA-082
T-18	LLAY068001	Coil LA-068
T-20	LLBY013001	Coil LB-013

REFERENCE NO.	TEABERRY PARTS NO.	DESCRIPTION
L-1	LLZY001013	Micro Inductor LF-1, 100 UHY
L-2,3,4	LLZY001021	Micro Inductor LF-1, 470 UHY
L-5,8,10	LLCY018001	Coil LC-018
L-6,7	LLEY008001	Coil LE-008
L-9,11,12	LLDY021001	Coil LD-021
L-14	LLEY003001	Coil LE-003
L-401	LLZY001009	Micro Inductor LF-1, 47 UHY
O.P.T.	TTFY087001	Output Transformer TF-087
P.T.	TTFY085001	Power Transformer TF-085
CT-1,401	CCVY024006	Trimmer, 50 MFD, CVE50-11
CT-2,3	CCVY024003	Trimmer, 20 MFD, CVC20-11
C-152	CELF112200	Electrolytic 22 MFD 10 V.
C-59	CELF113300	Electrolytic 33 MFD 10 V.
C-162,203,225,	CELF114700	Electrolytic 47 MFD 10 V.
C-159,99	CELF111010	Electrolytic 100 MFD 10 V.
C-222	CELF112210	Electrolytic 220 MFD 10 V.
C-189	CELF113310	Electrolytic 330 MFD 10 V.
C-133	CELF114710	Electrolytic 470 MFD 10 V.
C-155	CELF311000	Electrolytic 10 MFD 16 V.
C-154	CELF312200	Electrolytic 22 MFD 16 V.
C-58,195,201	CELF313300	Electrolytic 33 MFD 16 V.
C-207	CELF311010	Electrolytic 100 MFD 10 V.
C-198,209,502	CELF312010	Electrolytic 220 MFD 16 V.
C-138,199,204	CELF314710	Electrolytic 470 MFD 16 V.
C-192	CELF311020	Electrolytic 1,000 MFD 16 V.
C-151,168	CELF512290	Electrolytic 2.2 MFD 25 V.
C-93,188,224	CELF514790	Electrolytic 4.7 MFD 25 V.
C-503	CCZY015001	Electrolytic 2,200 MFD 25 V.
C-43	CELF814780	Electrolytic 0.47 MFD 50 V.
C-53,64,86,102,103, 105,106,156,157	CELF811090	Electrolytic 1 MFD 50 V.
C-210	CELF902210	Electrolytic 220 MFD 6.3 V.
C-52,98,206,208, 213, 87	CAAH511086	Aluminum 0.1 MFD 35 V. M

REFERENCE NO.	TEABERRY PARTS NO.	DESCRIPTION
C-132	CSEA664786	Tantal 0.47 MFD 35V M
C-35,49,145,161, 202	CQME811025	Mylar 0.001 MFD 50 V.
C-62,72,100,101, 131	CQME811035	Mylar 0.01 MFD 50 V.
C-39,57,73,75,78, 123,130,211,125	CQME814035	Mylar 0.04 MFD 50 V.
C-200	CQME812245	Mylar 0.22 MFD 50 V.
C-196,419,420,421	CCZY006001	Field-through 1,000 MFD 50 V.
		Silvered Mica Capacitors, 50 V. Type K
		Ceramic Capacitors, Types CH, R ZF, YA, & YG.
VR-1,16	RRVY103010	Semi-fixed 50 K OHM 6BM
VR-2,8,18	RRVY103008	Semi-fixed 20 K OHM 6BM
VR-3,17	RRVY103007	Semi-fixed 10 K OHM 6BM
VR-4	RRVY104005	Semi-fixed 3 K OHM
VR-5	RRVY103011	Semi-fixed 100 K OHM 6BM
VS-6,7,12,13	RRVY102007	Semi-fixed 10 K OHM 5BM
VR-9,11	RRVY103006	Semi-fixed 5 K OHM 6BM
VR-14	RRVY102010	Semi-fixed 50 K OHM 5BM
VR-15	RRVY103002	Semi-fixed 300 OHM 6BM
VR-501	RRVY102001	Semi-fixed 200 OHM 5BM
VR-10,22	RRVY049001	Varible 20 K OHM B
VR-19	RRVY027001	Variable 10 K OHM A w/Switch
VR-20	RRVY048001	Variable 100 K OHM B
VR-21	RRVY071001	Variable 50 K OHM B
R-122	RSJZ201205	Metal 12 OHM 2W
		Carbon Resistors ½ W
		Carbon Resistors ½ W
X-1	QQXY056001	Crystal 44.730 MHz
X-2	QQXY055001	Crystal 13.1325 MHz

REFERENCE NO.	TEABERRY PARTS NO.	DESCRIPTION
X-3	QQXY017001	Crystal 7.8025 MHz
X-4	QQXY054001	Crystal 7.795 MHz
X-401	QQXY057001	Crystal 10.000 MHz
CH	SSRY112001	Rotary SR-112
MODE	SSRY101001	Rotary SR-101
CAL-SWR	SSWY056001	Slide Switch SW-056
N.B./OFF-PA/CB	SSWY058001	Slide Switch SW-058
PWR SUPPLY	SSWY068001	Slide SW-068
FL-027	FFLY027001	Crystal Filter UF-0742B
ANT	JJKY002002	Antenna Connector JK-002
MIC	JJKY004001	Microphone Connector JK-004
EXT SP/PA	JJKY010001	Speaker Jack SJ-296
DC	JJKY011001	Power Connector JK-011
	ZFSY001006	Fuse, 3 amp
	JSKY001001	Crystal Socket SK-001
	ZFHY009001	Fuse Holder FH-009
	ASPY038001	Speaker SP-038
	ZMTY058001	Meter, MT-058 RF/S
	ZMTY009001	Meter, MT-009 SWR
	ZRLY016001	Relay RL-016
	VPLY005011	Pilot Lamp, RF/S Meter
	VPLY005001	Pilot Lamp, SWR Meter
	VPLY005003	Pilot Lamp, Channel
	AMKY040001	Microphone MK-040
	WWZY011001	AC Power Cord WZ-011
	WWDZ070004	DC Power Cord W-070004
	MDBP203219	Metal Cabinet
	MDBP202563	Bottom Cover
	MDBP203351	Back Panel
	MDMP103215	Front Panel
	MDMP40285	Volume Knob
	MDMP402826	Channel Knob
	MDMP402827	Channel Disc

REFERENCE NO.	TEABERRY PARTS NO.	DESCRIPTION
	MDNP403220	Brand Plate
	MDNP303221	Control Plate (wooden-grain)
	MDNP403222	Control Plate (Silver)
	MDNP403223	FCC Plate
	MDNP400286	Microphone Plate
	MDPP303227	Display Box
	MDPP303225	Styrofoan Box (left)
	MDPP303226	Styrofoam Box (right)
	MZPT187201	Instruction Manual
	MZPY000002	FCC Application Form
	MZPT000004	Warranty Card